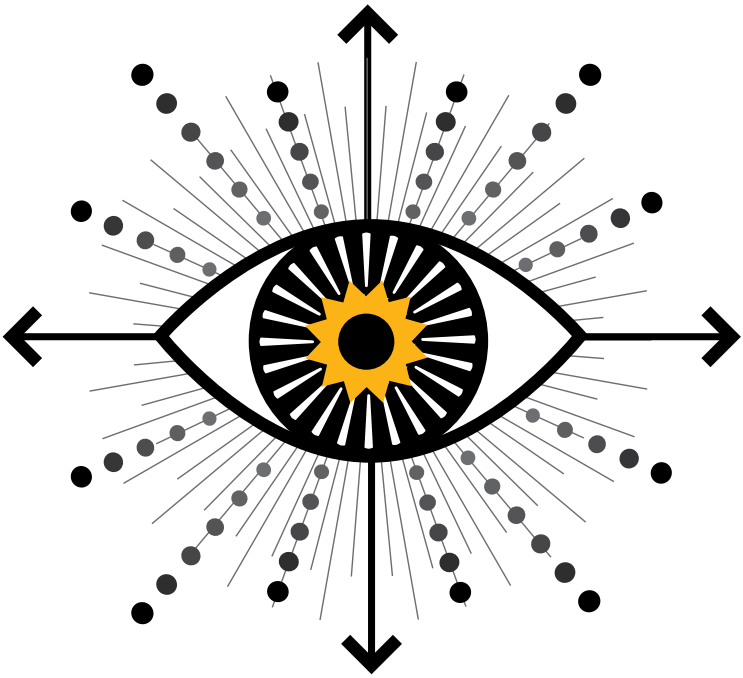

THE POWER OF VISUALIZATION

A PROBLEM-SOLVING GUIDEBOOK

STEVE CHILD

Written and Illustrated by Steve Child
Accompanying this booklet are related videos that cover the contents and most of the exercises in the guidebook. Look at this PDF properly in View > Page Display > Two-page view + Show cover page + Enable scrolling.

Special Thanks to Matthew Manos and Alicia John from verynice design for editing and making this available online. Special Thanks to Jill D'Agnenica and Mary Child for additional editing.

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Intro duction:

Visualization is a powerful tool that has been used for centuries by thinkers in a wide range of disciplines. Learn how to unleash your ability for creative thinking in this step-by-step guide.

This guidebook presents a range of internal and external visualization techniques and exercises, offering you valuable experiential learning. Tools such as mental recall, mindmaps, diagrams, and brainstorming will help you to see relationships, hierarchies, and insights into your problem-solving process. Most sections have a related video demonstration so you can see the process in action and follow along. Look for the eye icon and click to open the YouTube video. Makes sure to view this document in View>Page Display>2-page view in Acrobat.

You will learn to:

- Turn abstract ideas into concrete forms, making them easier to grasp and analyze.
- Translate imagination into actionable insight to arrive at innovative solutions.
- Apply divergent thinking to generate ideas and effectively communicate them.

Even an experienced designer and problem-solver can benefit by applying these tools. Regular practice will yield increasingly fruitful results.

Welcome! Click Here to Access Video

Power of Visualization:

An image can simplify complex ideas and get beyond what words might fail to express. Visualization's power lies in its ability not only to help generate and communicate ideas quickly and succinctly but also to organize thoughts, identify patterns, and see important connections. Designers refer to it as "the mother of all tools" because it is used at every stage of the design thinking process. Being able to produce appropriate and simple visuals makes information easier to understand, process, and remember. Visual thinking is a valuable skill to have, whether you're trying to solve a complex problem or communicate an idea to others.

We are all Visual Thinkers:

Humans are visual thinkers. Research shows that more than 50% of our cerebral cortex is involved in visual processing. We must interact with a visual world to survive, and we are constantly taking in visual information, whether images, movies, or advertisements, to understand and navigate the world we live in. Activities such as using a map or calendar, writing a grocery list, and driving a car all require visualizing information. If we ask you to imagine yourself sitting on a beach at the ocean sipping a cool drink, you would be able to conjure up an image. This is a form of visualization where we are using our "mind's eye" to bring that picture into existence. We also instinctively use our kinesthetic and visual perceptions of our body in relation to gravity, movement, and balance to orient ourselves in space. All these factors make us intrinsically visual thinkers.

"Creativity is inventing, experimenting, growing, taking risks, breaking rules, making mistakes, and having fun." – Mary Lou Cook

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We are all Inherently Creative:

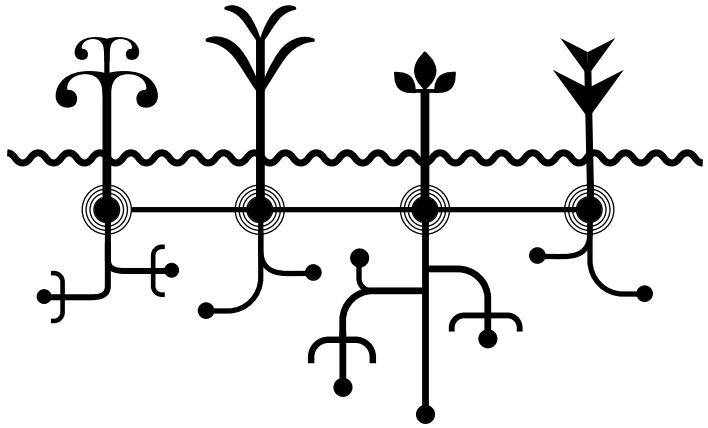
When you were a child you drew pictures freely, made up stories, played games and imagined. Your uninhibited creativity was incredibly important in growing your emotional, social, intellectual, and even physical development. Whether you remember your dreams or not, you dream consistently every night. Your unconscious mind creates ingenious narratives, with varied characters in vivid visual detail and expressiveness. Your dream world proves that you are naturally creative, even if that creativity is not expressed in the external world. Creativity engages our mind, allows us to make free associations, and opens alternative ways of thinking about solving problems.

Creativity as a Tool for Problem-Solving:

Educationalist Sir Ken Robinson claims that "creativity is as important as literacy and we should afford it the same status". The term creativity is used in a wide variety of ways. A child's drawing is creative and Einstein's theory of relativity, which changed a whole domain of physics, is also creative. There are different levels and different purposes for creativity. In this guidebook we will use creativity as a tool that supports your problem-solving abilities. It isn't necessarily an end in itself. We will use visual processes to trigger creativity in problem-solving and get you to see its usefulness for your needs. We want to bring out your inherent creative powers.

Ideas are Not Enough:

Being able to visualize an idea is a first step, but it is crucial to understand how to bring that idea to life. Materializing a solution to a problem requires many iterations. You may be faced with obstacles that require more creative thought and acceptance from others in your organization. Sometimes convincing others of the efficacy of an idea becomes the most difficult challenge.



Internal Visualization:

We can enhance our approach to design thinking and conceptualization by taking the time to clear the mind, and use internal visualization techniques. Researchers have discovered that when using internal visualization, the primary visual cortex of your brain is activated as if you are actually seeing and experiencing the images. That is why actors, athletes, and speakers use it to rehearse their performance.

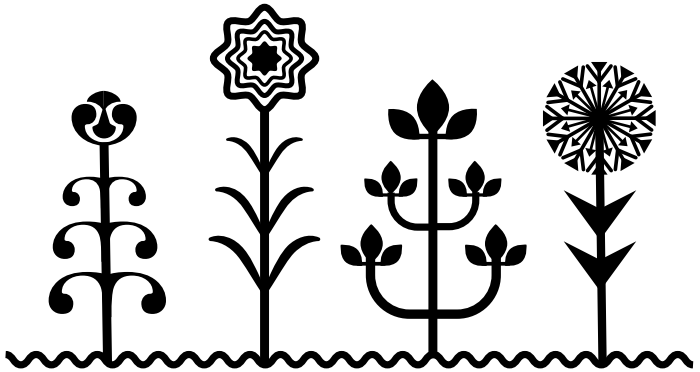
Internal visualization methods like mental rehearsal, meditation, envisioning, memory recall, and imaginative thinking can be powerful tools for solving problems. These techniques help you to develop images in your mind without necessarily producing an external result like a drawing. This can mean closing one's eyes and using what is often referred as "the mind's eye".

Think of a concept as a seed that you plant in the ground. While underground, you nurture it with internal visualization methods, research, and reflection. These nutrients are like the water and minerals that allow the seed to sprout and coax the idea-seedling above ground toward the sunlight.

External Visualization:

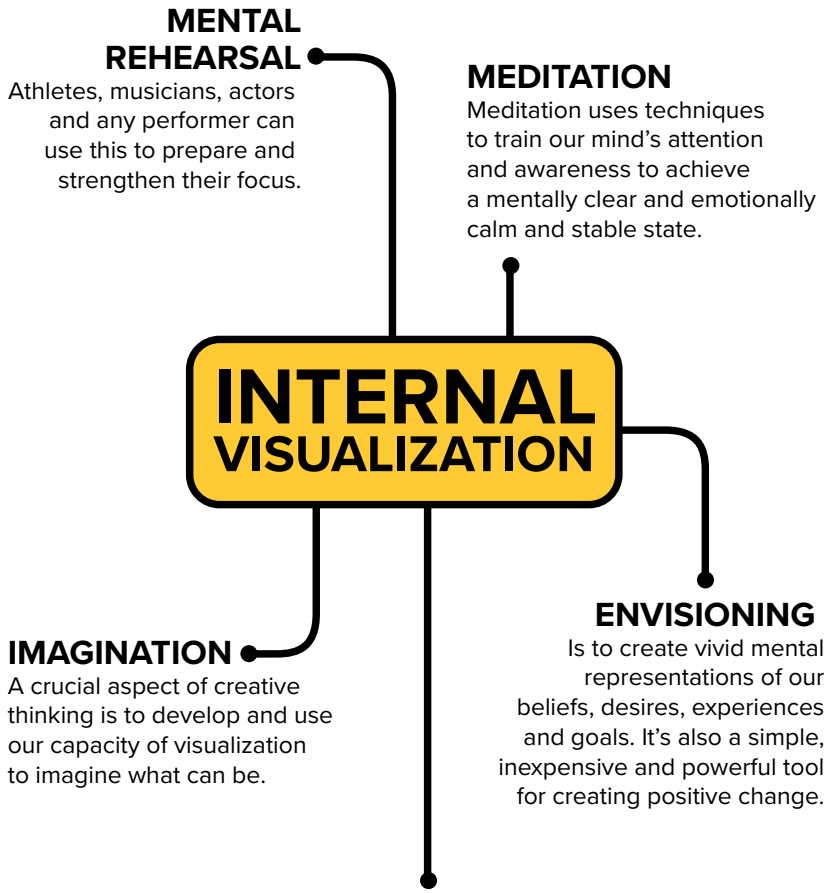
External visualization methods can be powerful tools for you to think and solve problems in many disciplines. Mindmapping, brainstorming, metaphors, models, storyboarding, journey mapping, and data visualization, all discussed in this portion of the guide, can help to stimulate your imagination and creativity so that you can generate unique and appropriate solutions. They can help you to simplify and break down complex problems into manageable pieces and allow you to develop concepts from a wide variety of perspectives. These representations are an invaluable tool because the human brain processes visual information more quickly and effectively than text. The techniques provided are essential in the design thinking toolkit.

Bathed in sunlight, our idea-seedlings have broken through the ground. They are beginning to be visible to the external eye (of yourself and others). We nurture their growth, watering them with more iterations of ideas and pruning them with judicious edits so they can grow strong and resilient.



Internal/External Video

A Variety of Internal and External Visualization Methods



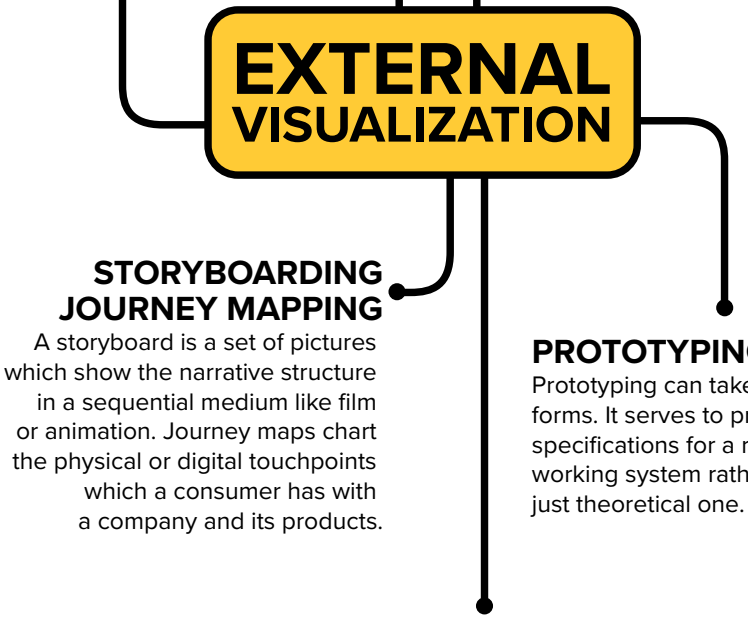
MENTAL REHEARSAL
Athletes, musicians, actors and any performer can use this to prepare and strengthen their focus.

MEDITATION
Meditation uses techniques to train our mind's attention and awareness to achieve a mentally clear and emotionally calm and stable state.

IMAGINATION
A crucial aspect of creative thinking is to develop and use our capacity of visualization to imagine what can be.

ENVISIONING
Is to create vivid mental representations of our beliefs, desires, experiences and goals. It's also a simple, inexpensive and powerful tool for creating positive change.

MEMORY RECALL
The mind's capacity to store and recall information is truly wondrous. Memory recall implements visualizaiton techniques to aid in our minds retrieval of information.



BRAINSTORMING
This can be an individual or group method for generating ideas and solving problems creatively.

MINDMAPPING
These are hierarchical diagrams that can reveal connections and the relationships among the components.

METAPHOR MODELS
Metaphorical expressions create powerful and lasting images of ideas. They are effective at communicating both tangible and conceptual information.

STORYBOARDING JOURNEY MAPPING
A storyboard is a set of pictures which show the narrative structure in a sequential medium like film or animation. Journey maps chart the physical or digital touchpoints which a consumer has with a company and its products.

PROTOTYPING
Prototyping can take many forms. It serves to provide specifications for a real, working system rather than just theoretical one.

DATA VISUALIZATION
Is a discipline that uses data is to communicate information clearly and effectively through graphical means.

Internal Visualization: METHODS

MENTAL REHEARSAL:

Athletes, speakers, and performers of any kind can benefit greatly from mental rehearsal. This means going through a set of actions in your mind's eye. This rehearsal is a simulation in real time of the specific activity. One might imagine going up on a stage to deliver a talk, and then giving the talk clearly and succinctly. By mentally rehearsing the process in your imagination, step by step, as an active participant, you are building neural networks that prime your actions to achieve successful outcomes.

Brain studies with athletes have shown that mentally rehearsing certain physical activities can have the same effect as actually executing those same physical activities. Mental rehearsal strengthens the mind-body connection and results in substantial improvements in performance.

"Having a mental snapshot of where you are, where you are going, and what you are moving toward is incredibly powerful."
—Sara Blakely, American businesswoman and philanthropist

Exercise: Mental Rehearsal for Improved Performance

Athletes like Michael Phelps and pro-golfer Jason Day use mental rehearsal to perfect their performance. In this exercise, we'll apply the same techniques with a simple ball toss activity. First, we'll toss a ball into a cup without any mental rehearsal. Then, we'll repeat the task after practicing mental rehearsal to observe the difference. This process can be applied to various daily tasks, such as giving a presentation, participating in an interview, and more.

Materials Needed: Ball (or anything your can toss), Cup (or any target for the ball), note-taking materials (pencil, paper, iPad, etc)

Estimated Time: 10 minutes

Step One: Task Set Up
Establish your task for the test. This should be something you can easily repeat. Ex. While seated in my stationary chair, I will toss a ball into the trash can.

Write your task here:

Step Two: Baseline Performance
Perform the task 4 times. After each attempt, circle your success level below.
Round 1: Fail / Close to Success / Success
Round 2: Fail / Close to Success / Success
Round 3: Fail / Close to Success / Success
Round 4: Fail / Close to Success / Success

Step Three: Mental Rehearsal
Close your eyes and visualize yourself completing the task successfully. How does the ball feel in your hands? What is its motion? What does it sound like when it lands perfectly?

Rehearse this as many times as needed until you feel confident.

Step Four: Post-Rehearsal Performance
Perform the task four times, rehearsing before each round. After each attempt, circle your level of success below.
Round 1: Fail / Close to Success / Success
Round 2: Fail / Close to Success / Success
Round 3: Fail / Close to Success / Success
Round 4: Fail / Close to Success / Success

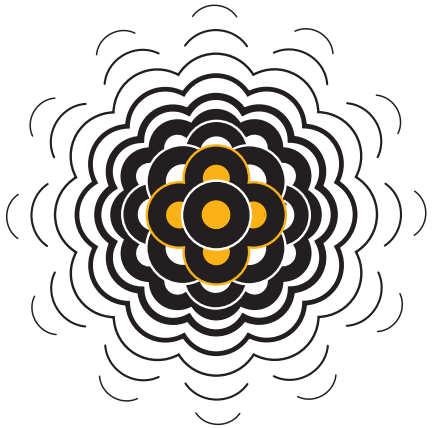
Step Five: Reflection
Did your results stay the same or change? Did your emotions shift? Was it easy to rehearse the action, or did you encounter any challenges? Feel free to write your thoughts below.

MEDITATION:

Meditation is a practice of focusing the mind to cultivate mindfulness and awareness. The practice of meditating helps you to slow down, focus your attention, and bring your mind and body in alignment. It is an opportunity to turn inwards and watch your mind at work.

A near constant torrent of information and external stimuli comes at us from our external environment. We text as we watch videos. We listen to the news as we drive in traffic. We are connected to technology and disconnected from ourselves. It is difficult to quiet the noise and find the space within to think. Taking time to turn everything off and come back to yourself allows you space to take note of habitual thinking and acknowledge fleeting thoughts that come to your mind. How long do they stay? They are not static or solid, they are flowing through you like a river.

"The kind of perspective that brings focus and clarity comes from space. And while we may not always have a choice about clearing our calendars, we can make the choice to clear our minds of the habitual momentum that blocks creativity and compassion." – Janice Marturano, *Finding the Space to Lead: A Practical Guide to Mindful Leadership*



Exercise: Guided Meditation

Let's take some time to slow down and stop your attention from running in all directions. With this guided meditation you will have the opportunity to turn inwards and watch your mind think. We will work to find calmness and clarity. This exercised is enhanced by watching the video.

Estimated Time: 10 minutes

Short Guide:
For a quick meditation, do the following:

- Find a quiet space and get into a comfortable position
- Close your eyes, take 3 slow breaths through your nose
- Focus on your breath coming in and moving out of your nostrils
- Follow your exhale to its full length before breathing in
- It is normal to have other thoughts wander into your head, make note of them ("I'm thinking about a situation at work")
- Once you have recognized and named it, gently brush it away and refocus your attention back to your breathing
- These thoughts are not static or solid, they will flow through you like a river.
- Continue breathing and brushing away your thoughts until you feel at peace.

Reflection:
Now that you've finished your meditation, how do you feel? How long did your thoughts stay? What emotions went through your head? Remember that meditation is a skill that you need to practice. Is there anything you would change in the future? Feel free to write your thoughts below.

Meditation Video

ENVISIONING:

To envision is to imagine, to picture. If you can first imagine yourself achieving a particular goal, your actions will align with that intention and bring about the attainment of your goal. Nothing gets done without taking action. But envisioning is an important and useful first step in setting our intentions.

Setting intentions is stating the goals and aspirations for your future. This is like setting the rudder of your boat properly, so you are heading in the right direction. Clearly envisioning a goal helps to give energy and enthusiasm to the intent and then proper action and appropriate steps can follow. Therefore, if you want something to happen in your life, first you have to think about it, set your goal to achieve it, visualize it happening, and then get to work to implement that intention.

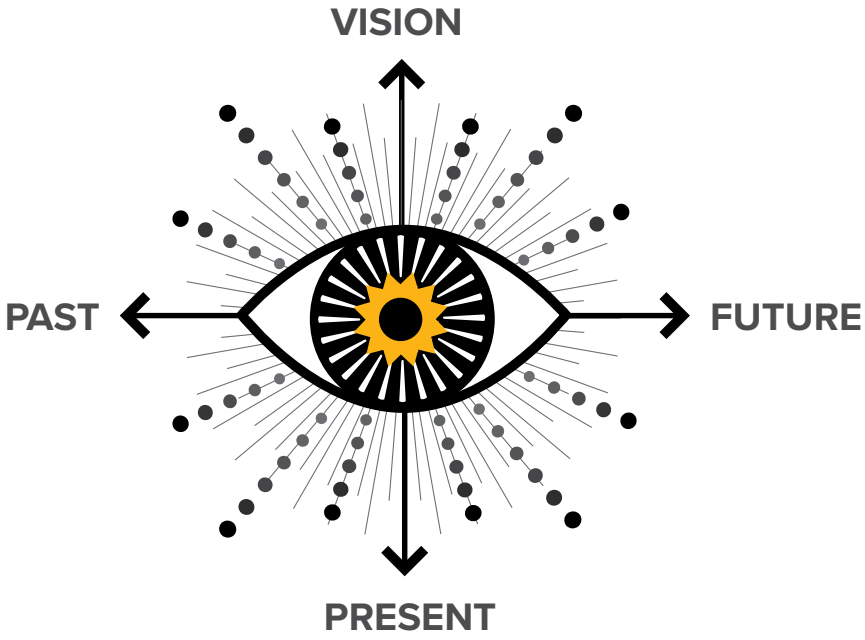
It is important to be specific about your goals and aspirations. It helps if they are:

- Clear and well-defined
- Achievable and related to your life's purpose
- Realistic and within your reach

In this section, we will create a vision board, a collage of images and words, to serve as inspiration and motivation towards achieving personal and professional goals.

"You can't get where you want to be, if you don't know where that is."
– Lewis Carroll's "Alice in Wonderland"

"To be truly visionary we have to root our imagination in our concrete reality while simultaneously imagining possibilities beyond that reality."
– bell hooks



Exercise: Creating a Vision Board

Creating vision boards is a popular way people can envision their ideal future and Let's use words, images, and collaging to create a "north star" that will inspire your growth.

Materials: Paper, magazines, pens, glue, or a digital tool like Figma or Procreate

Estimated Time: 30 minutes

Step 1: Set Up a Board
Use the following blank page, a decently sized paper, or digital workspace to start building your board onto.

Step 2: Aspirational Words
Write down 5 aspirational words for your immediate 5-year future. Underneath write a short description of those aspirations.
Ex. "Confidence" – Believe in my abilities so I can make decisions easier and feel better about myself and my work.

Step 3: Add Images
Sketch out images, cut out images from magazines, or import images from the web that you feel will reflect those aspirations. Organize them into a cohesive design.

Step 4: Reflection
Hang your board on the wall, take a photo of it, or review it regularly. How does it make you feel? Do you gain more clarity on your goals? Observe if you start making progress over time and feel free to update it as needed.

Envisioning Video

Vision Board

PICTURE SUPERIORITY EFFECT

Scientists posit that our brains process images approximately 60,000 times more quickly than similar amounts of written information. They hypothesize that this happens because images are "dually encoded" – as a picture and also as a word. This is the Picture Superiority Effect and we are now going to explore its usefulness for recalling complex lists of objects, names and information.

MEMORY RECALL

You have an amazing capacity for both short- and long-term memory recall. Most of us don't access this capacity because we haven't learned visual memorization techniques. Memory experts use striking creative visual images of the items to be memorized. The "Memory Palace" or "Method of Loci" is one of the oldest mnemonics (methods) designed to improve your memory. It was popular with the ancient Greeks but has most likely been around since the time of hunter-gatherers.

To create a Memory Palace, you mentally construct a room, or rooms, that can be invented or envisioned from places you already know, like your house. Once you choose a place, you then create a path within it to place items along the way that you wish to remember. You are encouraged to draw a map of your route and where the items are located. Not only do you distribute your items strategically in a particular order, but you transform these items in colorful and dramatic ways, so that you can't possibly forget.

It is helpful to mentally walk through the journey several times on paper first and then with your eyes are closed, until you can remember with ease. Also try mentally walking through the journey backwards to be sure that you can do it in both directions. The more specific and unusual the visual image is in your mind, the better for memory recall.

Exercise: Hacking a Memory Game

Visualization is a great way to improve your memory recall. In this exercise we're going to test our memorization skills before and after.

Materials: Pen, paper, or a digital tool where you can create visuals

Estimated Time: 15 minutes

Step One: Initial Word Selection
Use a random word generator program to generate 5 different words. Write them down below. Example: psychic, wave, turtle, arrow, fire

_____ _____ _____ _____ _____

In your 'minds-eye' create a visual image for quick, clear, memory. Be specific. If your word is 'dog', picture the breed, age, and coloring distinctly. You can use a memory palace or a creative combined image.

Step Two: Baseline Performance
Set a timer for a 5 minute break. Do not look at your list of words or think about your visual representations. Once the 5 minutes has passed, see if you can recite or write the 5 words in order. Record your results below.
Number of Words Remembered Correctly: _____

Step Three: Second Word Selection
Repeat Step One but generate 5 different words. Write them down below.

_____ _____ _____ _____ _____

Step Four: Create Visual
Repeat Step Two.
Number of Words Remembered Correctly: _____

Step Five: Post-Visualization Performance
Now see if you can create a visual in your 'minds-eye' that combines all 10 words together and in order.
Number of Words Remembered Correctly: _____

Record you results below. Reflect on your experience. Was your performance better? How can you improve your visualization? How can you use this in your day to day life?

Step Six: Reflection

_____

_____

_____

_____

_____

Memory Recall Video

IMAGINATION:

What is our imagination and where does it come from? The mental functioning that brings about our imagination is a complex coordination between many areas of our brain. Research shows that our memories and unconscious storehouse are the fuel for our imagination. We draw upon the images, words, and narratives we already have accumulated in our heads, and we build our imaginative ideas from them.

We start early in our childhood to use our imagination and it serves in the development of creativity, problem-solving, even social skills and motor functions. As little children we have the freedom to dream, play and invent. But our early exuberant imagination can get educated right out of us, as schools push us towards structured classes where rote memory, left brain thinking, and jumping through mandated academic hoops are privileged as required for success.

So our ongoing task as creatives is to rediscover, nurture and strengthen our imaginations. Adults in general and creatives in particular greatly benefit from exploring new ideas, thinking outside of the box, and even participating in make-believe.

The imagination is a unique human ability which is the wellspring for all invention and innovation. Developing your imaginative capacity will help you think more creatively in your art and design disciplines and in your own life.

"Imagination is more important than knowledge. For while knowledge defines all we currently know and understand, imagination points to all we might yet discover and create." – Albert Einstein

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Exercise: Exploring Your Imagination

Watch the video and take part in a guided exercise to explore your imaginative capabilities. Unlocking your imagination will lead to better performance at work, an easier time generating ideas, and more fun in your day to day life.

Materials: None required, feel free to use this page for notes

Estimated Time: 10–15 minutes

Notes

Imagination Video

External Visualization: METHODS

BRAINSTORMING:

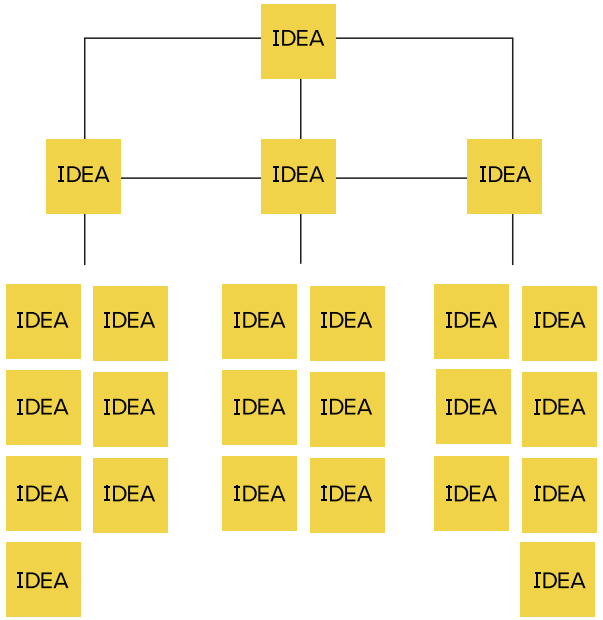
The goal of brainstorming is to produce lots of ideas quickly. It is a way to generate diverse options and focus deeply on solving a particular problem considered from many perspectives. A formal brainstorming session involves 5 rules:

1. Create as many ideas as possible
2. Ask an idea-seeking question
3. Defer judgment
4. Practice freewheeling
5. Seek add-ons or cross-pollinations

We want to work quickly to generate lots of ideas. Suppress the critical mind at this stage. You'll have plenty of time later to sift through the options to see what might work or what might need to be iterated on more thoroughly. Let loose and draw with simple lines and shapes. Keep the drawing light at first and put more pressure as you develop an image. Once you've finished the prescribed time period, you can look at all the solutions and develop even more interesting options by mixing and cross-pollinating ideas: a concept here mixed with another over there and ideas begin to grow exponentially.

A formal brainstorming session also involves asking an idea-seeking question or prompt that focuses the conceptual output towards a particular goal. The more specific the question the better. If a question is too broad, you will get broad answers. Be specific.

A typical question might sound something like this: "How many different ways can we get water to run uphill?" or "How many different ways can we combine the initials of your name to produce a logo?" In a group setting, agree on a set number of "sprints", setting a time limit for each with a rest period in between each sprint. For example, 3 sets of sprints, 7 minutes each, with 3 minute rest periods between each.



"The best way to get a good idea is to get a lot of ideas." – Linus Pauling, *Awarded both the Nobel Prize in Chemistry and the Nobel Peace Prize*

Exercise: Brainstorming Session

In this exercise, we will go through a brainstorming session for a prompt of your choice. Use this structure in the future for fruitful brainstorming.

Materials: Paper, pens, or a digital tool you can write and make shapes with

Estimated Time: 20 minutes

Step 1: Choose a Prompt
Choose a brainstorming prompt. This could be relevant to your life or completely random. Feel free to use one of the examples below. Ex. Improving bike safety in colleges; Handmade gift Ideas for Mom; STEM Video Game.

Write your prompt here: _____

Step 2: Round One of Ideation
On the following blank page, your paper, or digital tool, write your prompt. Set a timer for 1 minute. During this time, draw lines going out of the prompt with different ideas.

Step 3: Round Two of Ideation
Set another timer for 2 minutes. During this time, draw lines out of your ideas with additional ideas or more details. Try combining ideas. Repeat as many times as you would like.

Step 4: Connectors
Now, find connections between your ideas. Use lines to connect them. See what patterns and main trends occur.

Step 5: Reflect
What ideas did you come up with? Did you come up with one that you liked? How did this way of brainstorming differ from how you currently ideate? What did you like? What did you not like?

Reflection:

_____

_____

_____

_____

_____

_____

Brainstorming Video

Brainstorming

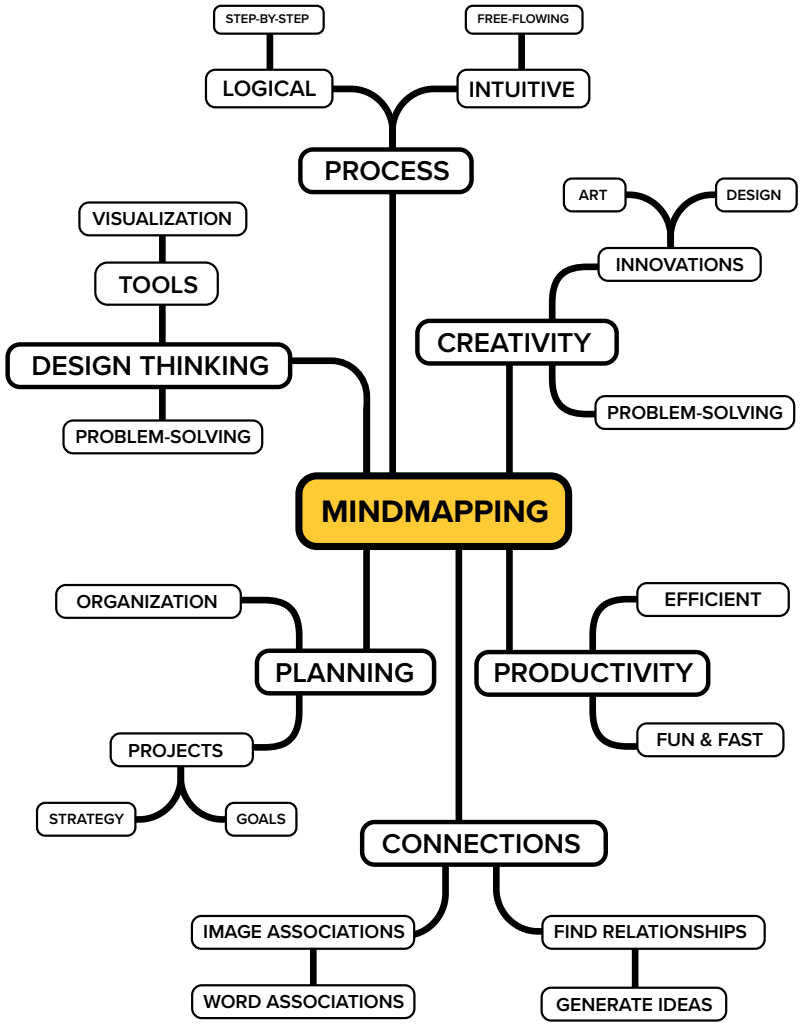
MINDMAPPING:

Mindmapping is an intuitive thinking tool that helps us to organize and see relationships between thoughts. We begin with a single word or phase in the center of our page. This is the focus of an area we want to explore. From this central axis we use branches with associative words that flow organically in all directions outwards. We might begin with the word “gratitude” in the center and consider all the areas that we can be grateful for in our lives: health, family, friends, education, etc. From each of these words we create even more branches, to find more associations and connections between our words.

You can write words only or accompany them with images. We want the process to be done with a pen or pencil and the lines to be organic, not rigid straight lines. This allows for the intuitive and free flow of ideas. We continue to add branches of more and more specificity to thoroughly explore an area of conceptualization. When finished we can see in a clear and cohesive way the scope of a search. This sketch can then be taken into a digital program and formalized in a more structured way, like the one shown on the opposite page. There are numerous mindmapping digital programs that you may want to investigate.

Mindmapping with a team is a great way to communicate and collaborate. Making a mind map allows team members to easily understand the central problem, add their own ideas, and clearly see how all the shared ideas interact and intersect with each other. In the end, the free-form process of creating a mindmap leads to a well organized visual map of your ideas.

“The mind map will change your life.”
– Tony Buzan, author of mindmapping books



Exercise: Mindmapping Gratitude and Challenges

Taking time to reflect on what you're grateful for and identifying areas for-growth can significantly enhance your mindset and fuel personal development. In this exercise, we will create two mind maps to guide your reflection.

Materials: Paper, pens, or a digital tool you can write and draw lines with

Estimated Time: 15 minutes

Step 1: Gratitude Mindmap
On the following blank page, or on your paper or digital tool, write "Gratitude" in the center. Set a timer for 5 minutes. During this time, let your thoughts flow freely as you draw organic, branching lines outward from the word "Gratitude," each leading to something you're thankful for. You can further expand on these ideas by adding sub-details with additional lines. Feel free to include images or sketches to complement your words.

Ex. Gratitude Family Sister Her kindness Helping me move

Step 2: Challenges Mindmap
On the following blank page, or on your paper or digital tool, write "Challenges" in the center. Set a timer for 5 minutes. During this time, let your thoughts flow freely as you draw organic, branching lines outward from the word "Challeng-es," each leading to something you're struggling with. You can further expand on these ideas by adding sub-details with additional lines. Feel free to include images or sketches to complement your words.

Ex. Challenges Low Productivity Procrastination Distracted Playing Video Games

Step 3: Summarize and Reflect
Now, give yourself 5 minutes to look over what you wrote down and reflect on your findings. What are you most grateful for? Do you take these things for granted? What emotions do are you feeling? What are the main things you're struggling with? Are there any actions you can do to combat them? Are there any common trends?

Reflection:

Mindmapping Video

Gratitude Mindmap

Challenges Mindmap

METAPHORS AND MODELS:

A visual metaphor is a representation of a concept, person, place, or thing through an image. It is an image that the viewer is meant to understand as a symbol for something else. Metaphors should make complex ideas easy to understand by using familiar images or symbols that evoke emotions, and create unexpected associations for the viewer. Some visual metaphors compare a physical similarity, while others compare a conceptual similarity. A physical similarity might be, "The world is your oyster," and a conceptual similarity might be, "The rabbit was the ray of sunshine that the family needed." The levels of complexity are based on how difficult it is for viewers to come to a conclusion on that specific visual metaphor.

Models can provide a simple and concrete representation of a physical entity or an idea. Think of the jovilabes that helped explain the rotations of the planets in astronomy or the double helix model that was the key insight into how DNA functions as the information molecule for all living systems. Einstein believed his great strength was his imagination and he relied on mental visualizations to construct many of his theories. Visualization can be helpful in all disciplines and sometimes those representations have led to major advancements within that discipline.

"Just as one needs to use or observe the use of a hammer in order to really understand its function, similarly, models have to be used before they will give up their secrets. In this sense, they have the quality of a technology – the power of the model only becomes apparent in the context of its use."
– Margaret Morrison & Mary S Morgan, Models as mediating instruments

Exercise: Visualizing Metaphors

In this exercise, you'll be provided with a series of written metaphors. Your task is to quickly create a visual sketch that best captures and communicates the essence of each metaphor.

Materials: Pen, paper, or a digital tool where you can make visuals

Estimated Time: 10–15 minutes

Step One: "Busy as a Bee"
Set a timer for 1 minute. During this time, quickly sketch a visual for this metaphor.

Step Two: "Time is Money."
Set a timer for 1 minute. During this time, quickly sketch a visual for this metaphor.

Step Three: "Back to Square One"
Set a timer for 1 minute. During this time, quickly sketch a visual for this metaphor.

Metaphor Video

PROTOTYPING:

A prototype is an early iteration of a product, created so you and others can see how it looks and functions in a tangible way. Various iterations are classified as low, medium, or high-fidelity prototypes. A low fidelity physical prototype is rudimentary and developed with cheap, inexpensive materials like Bristol board or cardboard. Regardless of the required fidelity, most prototypes will go through these stages: defining, focusing on features, production, feedback, iterate and repeat.

Prototypes are about testing your ideas. In the early stages of creation you want to keep the process fast and loose. This allows for flexible adaptation as needs arise. As you move to higher fidelity prototypes, more and more specificity will be required. The more detailed and defined the high-fidelity prototype, the quicker the discovery of design problems and the better estimation of materials and production needs.

Finally, testing a prototype on a group also helps us to understand the future user's experience of the product (UX and UI.) User Experience (UX) is used in both physical and digital products. UX considers the entire user experiences from structural design to user pain points with the goal of creating products that are pleasurable to use. User Interface (UI) is utilized in digital products. It focuses on the visual aspects of the product such as typography, color palettes, visual imagery, and buttons with the goal of creating an aesthetically pleasing experience for the user.

"I made 5,127 prototypes of my vacuum before I got it right. There were 5,126 failures. But I learned from each one. That's how I came up with a solution. So I don't mind failure." – James Dyson

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Exercise: Prototyping a Mobile App

Take part in a guided exercise to prototype a mobile app in rudimentary form. You will be walked through various stages of the onboarding process to the purchasing screen. Propose a mobile app product that incorporates 3 words from the list below and attempts to solve a real-world problem for a set of users: Pet • Map • Work • Exercise • Music • Stress

Materials: Pen, paper, or a digital tool you can draw on

Estimated Time: 30 minutes

Scratch Paper

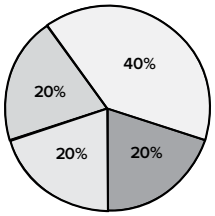
Prototyping Video

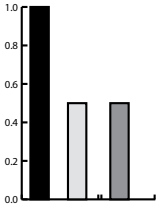
DATA VISUALIZATION:

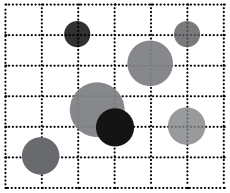
One of the best ways to understand data is to see it in visual form. With the ever-expanding quantities of information that we have access to now, it has become more important than ever to be able communicate this data effectively. Data visualization uses pie charts, bar charts, graphs, and numerous other specific visual structures as vehicles to interpret the meaning of the data presented. The type of data visualization structure you leverage will vary based on the type of data you're working with. The discipline has expanded creatively into many visual mediums and contexts. In our session we will cover some of the basic structures and how they can be beneficial in organizing information, whether for personal needs or for your organization.

Here are some important data visualization structures to research. The type of data visualization technique you leverage will vary based on the type of data you're working with:

- Pie Chart
- Bar Chart
- Histogram
- Gantt Chart
- Heat Map
- Box and Whisker Plot
- Waterfall Chart
- Area Chart
- Scatter Plot
- Pictogram Chart
- Timeline
- Highlight Table
- Bullet Graph
- Choropleth Map
- Word Cloud
- Network Diagram
- Correlation Matrices
- Decision Tree







Exercise: Visualizing your Habits

In this exercise, you will collect data for one of your daily activities and convert it into a creative visualization to better understand its significance.

Materials: Pen, paper, or a digital tool you can draw on

Estimated Time: 20 minutes

Step 1: Ideate Topics
Think of things you do daily that you can track data for easily. Write down three of them. Ex. Number of steps walked each day.

Topic 1: _____

Topic 2: _____

Topic 3: _____

Step 2: Select a Fitting Topic
Choose one topic that is well-suited for a bar graph. Refer to the text or supplementary video to review how to select the appropriate data for different types of graphs.

Chosen Topic: _____

Step 3: Collect Data
Record at least 10 different data points for your selected topic. Enter them into a table. Ex. Steps walked each day from 10/01 – 10/10

Data Visualization Video

STORYBOARDING and JOURNEY MAPPING

A storyboard is a series of pictures, much like in a comic book, that tells a story, provides instructions, or helps to show the flow of actions. Filmmakers use them to plan out the sequence of shots before filming their movies. The images can be accompanied by specific explanatory notes to help a reader make sense of what they are looking at. Using a storyboard can be a powerful visualization tool to think through a problem or to communicate a step-by-step process. Sometimes post-it notes are the best medium to use, as you are able to move the sequencing around easily to suit your narrative needs.

The purpose of a journey map is to chart the physical and/or digital touchpoints which a consumer has with a company and its products. We may think that a product interaction is between the consumer and the purchase but of course the advertising and marketing that come before and the customer service that follows a purchase are just as important. You want consumers to like your products and continue to buy them. There are generally four stages of the customer journey: awareness, consideration, decision, and loyalty. Journey mapping involves listening with empathy to your customer's "pain points". Where are the areas of greatest confusion or frustration? Are there areas in the process that are needlessly complicated? Are there any new unmet needs that have come up for the user?

"The storyboard for me is the way to visualize the entire movie in advance." – Martin Scorsese

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Journey Mapping Video

Exercise: Journey Mapping a Service Business

Participate in a guided exercise to create a journey map for a service business. You will outline the steps a consumer takes across digital and physical touchpoints of the product(s). Consider any pain points identified and explore ways to address them.

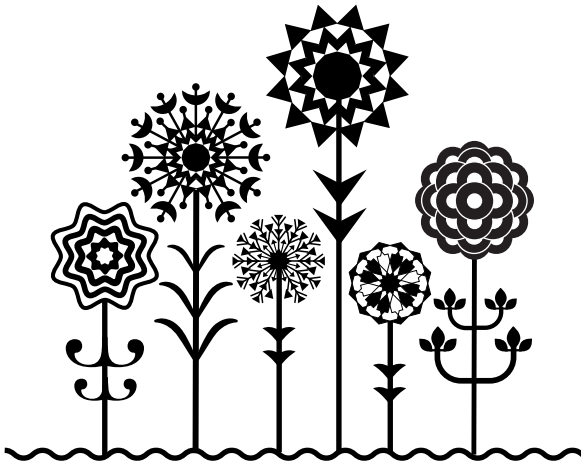
Materials: Paper, pens, or a digital tool you can write with

Estimated Time: 20 minutes

Scratch Paper

CIRCLE BACK, TIME AND TIME AGAIN

Although we have reached the end of this workbook, the techniques we have explored are meant to be used over and over again. As you continue to utilize visualization, your skills will be strengthened and will become second nature. You will be able to call upon them for problem solving with no conscious awareness of having done so.



ENJOY THE PROCESS!

One final note as we reach the end of this workbook. Don't wait to be happy. We say, "I'll be happy as soon as I graduate and get my degree" or "I'll be happy as soon as I successfully finish this job". We set conditions for our happiness in the future. It is like a mirage in the desert.

If we remain focused on the end result and not the process, we will miss out on the journey and the happiness that it can hold. Don't wait to be happy, you might be waiting your whole life. You have all the conditions to be happy right now, you don't need one more thing.